KATHOLIEKE UNIVERSITEIT LEUVEN
FACULTEIT LETTEREN
OPLEIDING TAAL- EN LETTERKUNDE

INNATENESS OR DEVELOPMENT?

A Confrontation between Generative Grammar and Cognitive Linguistics

Begeleider
Prof. dr. D. Geeraerts

Bachelorpaper
ingediend door

KRISTOF PELEMAN

Leuven 2006-2007

Table of Contents

Introduction

The study of language has known a long history, with roots in classical India and Greece. Yet, the foundations of current developments in linguistics only took place about half a century ago. Traditional ideas were re-examined, starting a whole new branch in linguistics, which has been very productive. This "renaissance" is what has come to be called the "cognitive revolution" of the 1950s and 1960s. The key figure in this revolution was Noam Chomsky. He changed the perspective from behaviour to the inner mechanisms of thought and action. He constructed the theory of generative grammar and has dominated the field of linguistics ever since, although some new trends have been developing since the last decades of the 20th century.

Chomsky's influence in linguistics is not to be taken lightly. His contributions to the field involve about fifty books, hundreds of articles and several lectures around the world. Now, fifty years later, he is still contributing to the latest developments, as a professor of linguistics at the Massachusetts Institute of Technology. His theory of generative grammar was based on a new conception on the faculty of language. In his view, there was an underdetermination of the stimuli of nurture and experience to account for the acquisition of language. Therefore he postulated an "innate" faculty of language, represented in the brain of the human baby, which could be nurtured into the acquisition of a particular language. Modern generative linguists still hold on to that main idea of Chomsky's linguistic inquiries. Current mainstream generative grammar consists of the "Principles and Parameters" approach and the "Minimalist Program". These are two frameworks, in which Noam Chomsky is still a leading figure.

In current linguistic debate, however, the innateness of the faculty of language is highly controversial. Recontextualizing tendencies denied the idea of an innate faculty of language and claimed that the nurturing of experience was a sufficient explanation for first language acquisition. These "nature-nurture controversies" go back all the way to the Chomsky-Piaget debate of 1975 and still hold to this day. In current linguistic inquiry people like Michael Tomasello criticize Chomsky's generative grammar. They propose usage-based theories to describe and explain human language acquisition. They claim that research on cognitive processes and interaction with a social-communicative environment provides enough empirical evidence that the assumption of an innate component of the faculty of language is completely redundant.

This paper will dwell upon these subjects in three main parts and end up with a conclusion. In the first part, the viewpoints of Chomsky's generative grammar will be summarized. Special attention will be given to aspects of innateness and their argumentation within the construct of generative grammar. The second part will show how generative grammar has developed over the years. It provides an outline for the Principles and Parameters approach and the Minimalist Program, and ends up with some problems concerning "nurture" and some recent insights concerning Broca's area in the human brain. With regard to the innate component, the last part confronts generative grammar with both older and recent recontextualizing linguistics. It starts off with the Chomsky-Piaget debate before going into more recent criticisms of the Chomskyan tradition. It ends up with the viewpoints of the usage-based theory of Michael Tomasello and other cognitive linguists. In the conclusion, I will give a short summary and some afterthoughts on this confrontation between generative grammar and recontextualizing linguistics.

I. Noam Chomsky and Innateness

1.1 The Faculty of Language

We can call Chomsky's views on language an "internalist" interpretation of the human language faculty. He considers knowledge of language to be something individualistic, something that is internal to the human mind. Therefore, he introduced the concept of "I-language" as an internal property of the human individual, within the tradition of the distinction between competence and performance. For Saussure, this was a distinction between "langue" and "parole". So, the notion of "I-language" more or less corresponds to what is called "competence": the internal language faculty of the human. However, there are two different approaches to interpret this concept. The most obvious one is the ontogenetic approach. This considers "competence" to be an individual's knowledge of language. In this view, competence is something dynamic and different for every single human being, depending on such factors as age, sex, education etc. A more abstract interpretation is the fylogenetic approach. This defines "competence" as the innate faculty of language of the human species. So, this view postulates some sort of static, built-in knowledge, common to the entire human race.

Over time, this second approach has gained a lot of importance in Chomsky's generative grammar. The faculty of language was regarded a quality that made a true distinction between man and animal, as a unique form of intellectual organization. The faculty of language was called a "species property", but not only that. The capacity for understanding and producing language was considered to be genetically determined, as "a part of our biological endowment"(4).[1] So, here, linguistics comes into contact with the domain of biology. As opposed to our alphabet, the faculty of language was not considered to be some sort of invention, but rather a product of biological evolution. Chomsky talks about the faculty of language in the same terms as, for example, the circulatory system. He characterizes the faculty of language as some sort of "language organ", which is basically an expression of the genes. He compares the acquisition of language to the growth of any regular organ in a human body, as they are both something that didn't require any active effort on the part of the individual. Like the possession of organs, the acquisition of language simply "happens" to a human child, in Chomsky's view. This is exactly what he means by the innateness of the human faculty of language. It is an essential part of our being, encoded in our DNA. So, the use of language becomes part of our nature. It is as internalised as the instinct to procreate. For Chomsky, the innateness of the language faculty is self-evident, because babies in the end always acquire language.

1.2 The Language Acquisition Device

In Chomsky's generative grammar, an individual's internalised language is always the result of two factors: an "initial state" and the course of experience. This hypothesized initial state he describes as an innate "language acquisition device". This is something which is, from a biological point of view, immediately there at birth – represented somewhere in the baby's brain. It already contains the necessary properties for language to develop further on,

---

[1] Chomsky, N. 2004. "New Horizons in the Study of Language". *New Horizons in the Study of Language of Mind.* 3-18.

like a seed that – if properly nurtured with water – will blossom into a flower. For the human baby then, however, the necessary nurturing is contact and experience with a natural language, the language that will turn out to become his or her mother tongue. So, the course of experience is a necessary input. The eventual output will be the individual's performance (his actual language use).

Now, starting from these axioms, Chomsky invited linguists from all over the world to do some research. He was of the opinion that studying the relationship between input (the course of experience) and output (actual language use) in human individuals might tell something more about this intermediate language acquisition device he had postulated. One problem with this was that experimental data only bears indirectly on the nature of the language acquisition device. Observations had to be carefully considered, whether they came from introspection, psycholinguistic experiments or neurophysiology. He also called this language acquisition device a common possession to the entire human species. With this, he meant that it should essentially be the same for babies all around the world, whether they're born in Africa, Europe, or America etc. Because of this, his research program did not restrict specific languages to themselves. Discovered properties of the language acquisition device in French-speaking people, would be equally valid for the language acquisition device in English, Japanese or Spanish people. So, Chomsky characterized the diversity and complexity of all of the world's languages as a mere superficial appearance. Essentially, they were "variations on a single theme". They shared a common ground and that was this language acquisition device in the brain of thé human baby.

This was all very well, but Chomsky's principles also brought along a lot of difficulties. It was very hard to find a successful approach to start investigating this initial state in significant ways, not in the least because of Chomsky's biological view on the development of language. He saw the development of language in the human mind as something dynamic, as an effect of the interaction, through time, of the language acquisition device with external stimuli. After all, life revolves around movement. Such an ongoing, dynamic phenomenon is of course very hard to study in its entirety and all of its complexity. So, this problem gave rise to a more flexible model for an effective methodological approach. This model added an extra dimension to the language acquisition device: time. It put the initial state of the language organ as the "starting point" in time. From the moment of birth on, then, the language organ would begin to assume different shapes or states. We might say it continually expands, for the further we go in time, the more knowledge of language we have. At a given moment in one's life, one's language organ is, for example, in "state L", while a certain amount of time later, it would be in "state L1". These states can be considered as "linguistic states" and they correspond to different points in time in someone's life. They represent someone's internalised language. On top of that, they each correspond to a specific organization in the brain of that individual, because of the biological basis of language in generative grammar. They're hypothetical freeze-frames, which should allow us to look more closely at different points in time of the language organ and – more importantly – what has transpired in between. Studying the initial state then becomes a matter of "rewinding the clock". After all, if "state L" follows "state K" and if we can understand the mediating brain mechanism(s) between them, we could see what part of the evolution is due to experience and what part is not. That way we could work toward the presumed initial state and strike the very core of the language acquisition device.

1.3 Poverty of Stimulus

The methodology described in the previous paragraph, reminds one of the behaviouristic approach to linguistics, in the tradition of Bloomfield. This earlier approach was materialistic, rather than mentalistic. It characterized first language acquisition as a complex succession of external stimuli of the environment and responses of the human infant. Here, however, it amounts to an investigation to find out whether the linguistic behaviour of infants can really be regarded as mere responses, conditioned by external stimuli. In other words, it tries to find out whether experience (nurture) alone is sufficient to establish the first language acquisition in human infants. After studying this, there was the radically different conclusion that the child seems to know a great deal more than experience has provided, even from the earliest stages on. In a very limited time-span, an infant understood words and concepts in such profound ways that almost went beyond description in language itself. On top of that, it was amazing how a child was able to master a particular natural language, in all of its complexity, in just a few years. After all, previous efforts to describe the particular natural languages in the world had shown how their complexity made them nearly "unlearnable". So, the conclusion was that stimuli from the environment were not a sufficient explanation for the acquisition of something as complex as a natural language. This is a well-known claim that goes by the name of the "poverty-of-stimulus" argument. This argument is precisely what led to Chomsky's postulation that a large part of our knowledge of language must be innate. So, with this he put a lot more emphasis on language as a part of our nature. He toned down the behaviouristic component (nurture) in first language acquisition, in favour of a much more naturalistic view. He said that the language acquisition device had the core properties of language already built in from the start. The environmental triggers, in their turn, would determine what particular language a baby's language acquisition device would eventually "generate".

Human language can also be characterized by its property of "discrete infinity". This means that the grammar of a language (in its most traditional sense) allows it to generate an infinite number of sentences: every conceivable grammatical sentence for that specific language. The "I-language" of an individual is precisely the ability to do this. However, experience cannot teach all these conceivable sentences. Yet, people are able to generate and understand sentences they've never encountered before. So, here, too, there seems to be a poverty of stimulus. This quality of endless possibilities in language is not taught to us by experience. Somehow, the mind must already possess the basic principles.

1.4 An Isolated Grammar

From the mid-1950s till 1980, these ideas of Chomsky have dominated the field of linguistics. They can be characterized as highly naturalistic, since they put a lot of emphasis on innate mechanisms to account for first language acquisition. Chomskyan linguistics was typically decontextualizing. It underlined the importance of innateness and restricted the influence of factors such the social context, the cognitive context of experience and the situational context of language use. By therefore "isolating" the faculty of language from its context, Chomskyan linguistics have come to be referred to as "an isolated grammar". After all, this was an intrinsic characteristic of its own logic. It called knowledge of language something that was genetically determined and postulated a great amount of innate knowledge. The lexicon of a language (the vocabulary), however, is completely dependent on the context in which a particular language is learnt. That is self-evident from the

Saussurean notion of the arbitrary link between the sound of a word and its meaning. So, this innate knowledge of language, which Chomsky isolated from the context of experience, must refer to the formal rules of language, i.e. syntax, grammar.

From the 1980s on, trends to recontextualize the grammar have been highly successful. Nevertheless, current generative linguistics still has a lot to offer. More specifically, there are two interesting research programs: the theory of "Principles and Parameters" and the "Minimalist program". These will be discussed in the second part of this paper.

II. Modern Generative Linguistics

2.1. Introduction

Following Chomsky's achievements and pursuits, modern generative linguistics was also interested in the basic properties of the innate faculty of language and the language acquisition device. However, it had already been proved in the past that this was no easy pursuit. On the one hand, natural languages all over the world had shown a complex diversity in their structure. On top of that, Chomsky's transformations and his deep and surface structure made particular languages seem even more complex. On the other hand, the 'innate knowledge of language' was supposed to be universal, identical in humans all over the world. All languages had to have a common structural basis, a set of rules known as 'Universal Grammar'. These two standing maxims of generative linguistics were hard to reconcile. So, there was a lot of friction in generative linguistics. Theorizing on the necessities of any genuine theory of language brought forth two necessary conditions that were to be satisfied: "descriptive adequacy" and "explanatory adequacy". The descriptive adequacy demanded an accurate account of the properties of particular languages. This could be found in the grammatical rules of each particular language and therefore did not pose any problem. The explanatory adequacy, however, demanded that we could show how each particular language can be derived from the same, innate language acquisition device. It hoped to explain the properties of human language at a more abstract level. In the course of time, descriptive and explanatory adequacy suffered an even growing tension between them. As explanatory adequacy aimed at a unification of human language, descriptive adequacy only laid bare more variety among rule systems in the world's languages. The revolutionary theory of "Principles and Parameters" sought to resolve this problem.

2.2. Principles and Parameters

The principles and parameters approach is a framework within generative linguistics that has been formulated during the 1980s. It was an endeavour and a joint effort of many linguists, but the most standard work to communicate its viewpoints was Chomsky's *Knowledge of Language: It Nature, Origin and Use* (1986). Now, to resolve the tension between descriptive and explanatory adequacy, the principles and parameters approach wanted to do away once and for all with the rules of grammatical construction. Grammatical constructions like, for example, the passive voice and relative clauses, were considered to be useless taxonomic artefacts. They were only useful to satisfy the descriptive adequacy, for they categorized parts of language, very much in the same way as biology had made a distinction between mammals, birds, reptiles, amphibians and fish for the vertebrates in its taxonomy. A genuine explanatory adequacy demanded a different approach. The grammatical "rules" of particular languages had to be decomposed into general principles and parameters of the innate and universal faculty of language. Only then would it be possible to see how every particular language could be deduced from the innate language acquisition device.

An efficient analogy to conceptualise what is meant, is the "switch box". This analogy portrays the initial state of the faculty of language as a network connected to a switch box. The switches then represent different parameters (options) of the universal and innate faculty of language. At birth, these switches are all still in there "neutral" state. The language has not taken any road yet. It can still become Dutch, French, Chinese, Swahili, or whatever. This is the initial state in its most pure form – all nature. It is the universal grammar of

human language in general and I'd like to call it Chomsky's Holy Grail. After all, this image embodies everything, which is innate about the human faculty of language. Now, from the moment of birth on, the input of experience will gradually set the switches in the right order to turn the infant into a trained, native speaker. So, environmental triggers will determine the particular language of the individual. That is self-evident. The particular choice of settings on the switch box (the language acquisition device) then corresponds to, for example, Dutch. However, a different choice of settings would have constituted German, or another Japanese, etc. So, via a simple adjustment of the settings of the parameters French could, for example, be deduced from Japanese. Of course this is not meant literally, but only at the abstract level of their "grammar". That almost goes without saying, because the lexicon is 100% nurture, since structuralism (Ferdinand De Saussure) has shown that the link between the sound of a word and its meaning is completely arbitrary and conventional. To come back at the switches now, it is important to know that they are of a binary nature. They can either be set in "mode 1" or "mode 2". These two modes either represent a distinction between two more or less opposite options, or they represent a certain possible quality of language, which is either expressed or kept off (as a possibility not chosen or a road not taken).

This was all very interesting as a way of theoretical inquiry, but as long as it remained impossible to 'tag' these different switches of the language acquisition device, it wasn't a step further into understanding the core of the innate faculty of language. It was necessary to know which specific underlying parameters each switch represented. So, in fact, this opened up a lot of possibilities for new research. Possible principles and parameters had to be stipulated. Within that endeavour, they made one basic distinction: that between principles and parameters. The parameters would be a list of all the possible switches on the "switch-box". They should account for the syntactic variability among the particular natural languages. The principles would be a list of all things fundamental to all natural languages. So, for years, linguists tried to bring out what is universal in all known natural languages and what underlying parameters might explain their variety. There was an explosion of empirical research into typological traits of all human languages, and it has proven to be very productive.

Various principles and parameters have been stipulated to enforce the claims of the principles and parameters approach. Perhaps the most famous principle is the "Projection Principle", proposed by Chomsky as a part of his generative-transformational grammar in *Knowledge of Language: Its Nature, Origin and Use* (1986). This principle claims that in generating the phrase structure of a sentence, the 'properties' of its lexical items always need to be preserved. A fully transitive verb, for example, cannot be left without its object. So, according to Chomsky, this principle would be a universal quality of all known human languages. Other examples of stipulated principles are the structure preservation principle and the trace erasure principle. Among the proposed parameters there are the pro-drop parameter, the head-directionality parameter, the subject-side parameter, the topic prominent parameter, the ergative case parameter etc. I'm not going to give an outline of all these theorized parameters, because it's quite beyond the scope of this paper. It would take a little too much time to go into all of them, but I will discuss two of them in short, so one might get the gist of it.

The pro-drop parameter, for one, refers to the "dropping" of pronouns. A language can be either a "pro-drop language" or a "non-pro-drop language". In pro-drop languages specific classes of pronouns may be omitted, when they're pragmatically deducible. So, because the person or thing that is referred to can be inferred from context, they are not linguistically

represented. They are only conceptually present in the semantics of the sentence, like a sort of zero-element. They are underlying structures of the surface. This is also consistent with Chomsky's notions of mentalism and abstraction: it is possible to postulate "invisible" knowledge. This is part of Chomsky's framework of "Government and Binding" and "deep and surface structure". Examples of such pro-drop languages are Japanese and Turkish, while English is considered to be a non-pro-drop language. Nevertheless, pronouns and other words are sometimes omitted in English, for example in commands and informal speech. Another proposed parameter is the "head directionality parameter". In this case, languages can either be "head initial" or "head final". This means that, in forming larger phrases, the head can either precede or follow these larger constructs. Now, the principles and parameters approach claims that such conceptual possibilities of language are a priori present in the innate language acquisition device. They are there as a list of binary options, which will be set in some kind of order by empirical contact with a natural language. So, hypothetically, two languages might be identical in their grammar by some coincidence, how ever different they might be in their lexicon.

2.3. The Minimalist Program

Currently, the theory of Principles and Parameters, as described in the previous paragraph, is embedded in the "Minimalist Program" of generative linguistics, which started in the 1990s. This is perhaps an even more radical theory than the Principles and Parameters approach, as it tries to do away with all conceptually unnecessary constructs of the past. It has tried to redefine the foundations of generative grammar. However, it remains a "generative" grammar in the sense that it sticks to the claim of an innate faculty of language. It claimed that the I-language (the innate faculty of language) only needed two unitary levels of representation: PF ("Phonetic Form") and LF ("Logical Form"). The link between these levels also had to be "minimal". So, in fact, it is a program to investigate whether the universal grammar of natural languages displays an optimal functionality, without redundant elements. This program has sprung from Chomsky's claim that the design of general human language might be very close to "perfect".

This claim of a "perfect design" for language has not arisen out of the blue. It has sprung from a more cognitive perspective within generative grammar. After all, the faculty of language was embedded within other cognitive systems of the human mind or brain, with which it had to interact. These other cognitive systems were predominantly the sensorimotor systems, the conceptual system and the computational system. These kinds of systems had to be able to interpret linguistic expressions in order to use them as "instructions" for thought and action. This necessity of these cognitive systems therefore put "legibility conditions" on the generative processes of the faculty of language. They had to be able to "understand" language somehow. With regard to this, the PF, which I have mentioned before, corresponds to necessary "phonetic representations". These are imposed by the articulatory system and the perceptual system (the sense of hearing). They are subsystems of that sensorimotor system mentioned before. So, the specific design of these systems allows them only to interpret certain phonetic properties, but not others. A striking analogy are the limits of our visual system to just a small part of the spectrum of light. These properties are accurately described in phonology (the phoneme). In the same way, the LF or Logical Form corresponds to necessary "semantic representations". This is a little more abstract, but still somehow possible to conceive. After all, the conceptual and the computational system rely on the faculty of language as a medium to express and interchange our thoughts. Thought is expressed in language, even bound to it somehow. So, these cognitive systems impose on

language specific semantic properties. Now, an ideal coordination between the faculty of language and all these systems that put legibility conditions on it would mean that language is "perfectly engineered" as a code in our DNA, without any redundant characteristics. However, the existence of something like transformations (movement and displacement processes) in language seemed to be conceptually unnecessary. Also complexities like declensional paradigms appeared to be semantically useless, for they needlessly duplicate information that is already present. They were called "uninterpretable features" – features being the properties of sound and meaning.

In *The Minimalist Program* (1995), Chomsky therefore develops the ideas "economy of derivation" and "economy of representation" to account for these oddities. The principle "economy of representation" demands from every single grammatical structure to have its purpose. The transformations and declensional paradigms mentioned before therefore pose a problem. What exactly is their use? To explain transformations, one could resort to the theory of topic and comment. This theory motivates the existence of transformations by the possibilities it offers to structure information for optimal communication. After all, conceptual constructs in language have a hard time dealing with mental leaps. By putting something in initial position, one can provide that element with more salience. This helps the reader or listener to follow the speaker's or the writer's train of thoughts. Transformations allow us to do this. So, this functionality makes transformations imposed by other systems in the brain than the faculty of language. "Economy of derivation" tried to deal with the so-called uninterpretable features, like declensional paradigms. Chomsky proposed that they, too, had their functionality and that this apparent "imperfection" could be linked to interpretable features. He claimed that this "grammatical duplication" was the motor behind movement processes (transformations), which made it interpretable. So, in fact, every claim in the minimalist program seems to have only one purpose: to elicit the "perfect" design of the innate faculty of language.

Also in the workings of the computational system the Minimalist Program has broken with the traditional generative grammar. The basics of computation, of course, remain the same: language involves three essential elements. These are features (properties of sound and meaning), lexical items and complex expressions. The computational system also uses two basic operations to generate expressions: features are assembled into lexical items, and lexical items into larger syntactic objects. In traditional generative grammar, phrase-structure rules were embedded in the "X-bar theory", a theory mostly famous because of its visual representation with parse trees. In this theory, X-bar was an elementary feature of the syntax of all natural languages, and therefore part of the genetically determined faculty of language. It claimed that grammatically correct syntactic structures were immediately accessible to the human mind, and that the computational system merely had to fill in lexical items into the slots. The minimalist approach, however, eliminated the necessity for phrase-structure rules entirely, in favour of a more ad hoc formation of syntactic structures. This minimalist theory of phrase structure is called "Bare Phrase Structure". It emphasizes two basic operations: "Merge" and "Move". "Merge" was proposed as an alternative for the phrase structure rules, "Move" as an alternative for transformations. The operation Merge simply takes two objects and merges them into a larger object with the properties of the target object. For example, "eat" and "cake" can be merged into "eat cake". The target object here is "eat", for the constructed phrase is a verb phrase (like "eat") and not a noun phrase (like "cake"). The operation Move is a little blurrier. It can basically move anything anywhere and the application of it depends on the parameter settings that determine particular languages in the

Principles and Parameters approach. So, with Merge and Move phrase formation was reduced to its most basic, fundamental operations conceivable.

2.4. Broca's Area

Here, I'd like to abandon the different frameworks Chomsky's generative grammar has brought forth and go back to its core of innate biological endowment. Now, recent developments in science in all of its different branches have brought to light a lot of exciting new insights. One of these branches is biology, more specifically neurological science. It has already been mentioned that Chomsky's approach to the innate faculty of language sought approximation – or at least cooperation – with the domain of biology. After all, his theories of an innate, mediating language acquisition device have always been highly speculative. With regard to the faculty of language and innateness, his work seemed more to have the standing of philosophical inquiry than of a serious, scientifically founded theory. When it came down to empirical evidence, his ideas always came a little short. Not without reason I have called Universal Grammar Chomsky's Holy Grail. It lacked reference to material substance. Today, however, we seem to be realizing that cooperation between linguistics and biology in the brain sciences. By using neuroimaging techniques and functional MRI (Magnetic Resonance Imaging) experiments, new insights in linguistic operations have arisen, as represented in the human brain.

These experiments have shown that "Broca's Area" plays a vital role in the processing of language. This is a part of the human brain, located more precisely in the inferior frontal gyrus. Special references are made to area 44 and 45, as the most activated areas of the brain, when it comes to language. Modern generative linguists have come to associate these areas with "exclusive syntactic specialization". *Grodzinsky* (2000) even claimed that area 44 was exclusively preserved for syntactic transformations. *Indefrey* (2003), too, had noticed a strong activation of the Broca Area (area 44 and 45) in all kinds of syntactic operations. So, this biological isolation in the brain of some "central processor for syntax" somehow seemed to confirm Chomsky's claims about the innate faculty of language. It was as if "syntax" – meaning Universal Grammar – was materially represented in the inferior frontal gyrus of the human brain, like a tangible form of the innate faculty of language.
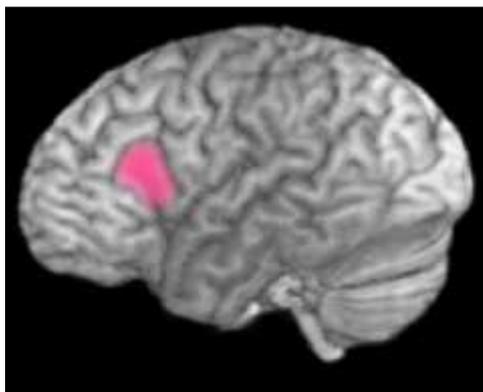
Broca's Area

Nevertheless, this rather seemed like jumping to conclusions. Experiments also showed how there was considerable overlap in the activation of Broca's area with other cognitive functions. So, Broca's area became subject to diverse and careful observation. Within their pursuits, generative grammarians have come up with some solid experimental arguments to maintain the link with Universal Grammar. Experiments by *Dogil et al*. (2004) once again

affirmed the central role of area 44 and 45 in syntactic processing: "…the activation in Broca's area disappears when syntactic processing is subtracted from semantic processing and vice versa" (340).[2] By claiming here that this part of the brain is only involved with syntactic operations and not with lexical interpretation, it completely shuts out the nurtured element: vocabulary. After all, for generative linguists, area 44 and 45 are supposed to be an untouched, innate materialization of universal principles of language. They considered occasional differing patterns in this activation site to be much less striking than the similarities it showed concerning syntactic operations.

Another argument was the comparison with non-natural languages, i.c. programming languages like Prolog, Perl and Java. First of all, experiments showed how syntactic complexity could be associated with small activation foci in the left inferior frontal gyrus. A typical example that is often referred to, is the "decoding of sentences with center-embedded versus right-branching relative clauses" (329).[3] These kinds of syntactical anomalies display the typically hierarchical structure of phrases in natural languages and they always seem to activate some parts of Broca's area. However, when this was examined for programming languages, there didn't seem to be any active participation in the Broca area. It was stipulated that this could be explained by the linear nature of the syntax of programming languages. Only natural languages had the privilege of a hierarchical structure. So, following this reasoning, it was claimed that Broca's area only reacts to those languages following Universal Grammar, i.c. all natural languages.

A last argument could be "Broca's aphasia". This is a condition of people whose Broca area is damaged. So, it is interesting to see in what way this damage affects their language. Now, it appeared that damage to the Broca area resulted in difficulties to both understand and create syntactically complex sentences. Their lexicon, however, appeared to be mostly intact. When these people try to communicate their conceptualisations (which they undoubtedly still can) it takes the form of linking lexical items with pauses, which should instead contain some form of syntactical structuring. Usually, they are aware that they're not speaking properly. So, this is inescapably a strong argument to defend the idea that Broca's area represents one's "grammar" in the brain.

Recontextualizing linguistics, on the other hand, look at Broca's area in a different way. They claim that this division of the human brain into dedicated areas – like the Broca's area for syntax – is an oversimplified way of looking. They think more attention should be spent on the overlap of several parts and functions of the human brain and how they interact. How exactly they regard Broca's area will be discussed further on, in the last part of this paper.

2.5. Problems with Nurture

Here I intend to halt the mere descriptive intentions this paper has maintained up till now. I will not only give a descriptive account of arguments in this chapter, but I will also try to assess them critically. This transition towards a more critical approach is an introductory preparation to the contents of the third part of this paper.

---

[2] Dogil et al. 2004. "Where and how does grammatically geared processing take place – and why is Broca's area often involved? A coordinated fMRI/ERBP study of language processing". *Brain and Language*. 89.2. 337-345.

[3] Müller, R. & S. Basho. 2004. "Are non-linguistic functions in "Broca's area" prerequisites for language acquisition? FMRI findings from an ontogenetic viewpoint". *Brain and Language*. 89.2. 329-336.

First of all, it needs to be mentioned that generative grammarians consistently emphasize that there's a *necessity* for extralinguistic experience in language acquisition. Chomskyans' main problem with behaviouristic, constructivist and developmental approaches is their claim of the *sufficiency* of experience for learning a language, without any innate "fixed nucleus" for language acquisition. They don't see how exposure to utterances could account for the emergence in a child of the "semiotic" function, which links these utterances to their extralinguistic referents in the real world. In the article *Language and Experience* [4], three main problems are proposed for learning exclusively from observation.

The first of these is that there would be "too many encodings of experience" available to the child. By this, it is meant that a specific real-world context has countless ways to be described in language. In other words: there are a lot of ways to refer (linguistically) to the same object or event. In the same way, a child has a choice of a wide range of conceptualisations of this real-world context. So, an utterance could easily be "wrongly interpreted" by a child, if its structure would not coincide with his conceptualisation of that real-world context it supposedly refers to. A child could easily make mistakes in linking words with referents, and thereby attributing words with false meanings. This reasoning would prove the necessity to stipulate an innate component in language acquisition, according to Landau and Gleitman:

> If no child chooses the false solution, the question is how they all know enough to avoid them. If some of the children do choose falsely (…) the problem is how we ever manage to understand each other. Thus the general acknowledgement that context is necessary should not be confused with a proof that it is sufficient for language acquisition (210).

An example is provided as a way of illustration. A situation is invoked, where a cat is sitting on a mat. Now, in a simplified way, this context could be referred to in either a "cat-on-mat" utterance or a "mat-under-cat" utterance. The child also has the choice between these two possible conceptualisations in his view. So, it is claimed that the child might link one of these utterances with the opposite conceptualisation of that scene, and consequently, for example, link the word "cat" with the "mat" of the real-world context. However, this seems to be quite a weak point of argumentation. Firstly, this reasoning implies the child actually already understands the basic communicative meaning of the words uttered. This seems highly unlikely. Secondly, even if that would be the case, since the basic knowledge to grasp something like this is already acquired by the child, the child would probably already be smart enough to recognize this earlier "mistake", too, when confronted a next time with one or both of the same referents.

A second argument that is upheld is that of "false experiences". This says how a child might falsely pair the speech of a parent or caregiver to a scene the child is simultaneously inspecting, resulting once again in wrong semiotic links. Once again, I find this argument to be based on dubious assumptions. Here, it is implied that the child interprets this "noise-producing object" (the caregiver from the point of view from the baby) as consistently trying to semiotically link the extralinguistic objects and events of the environment he perceives with sound patterns (words). This seems rather implausible to me.

A last argument Landau and Gleitman propose are "abstract meanings". Here they somehow criticize the notion in contextualizing linguistics (as opposed to Chomsky's isolated grammar)

---

[4] Landau, B., Gleitman, L.R. 2004. "Language and Experience". B. Lust & C. Foley (eds.) *First Language Acquisition: The Essential Readings*. Massachusetts Institute of Technology, 208-221.

that the earliest vocabulary of children would consist of words with a recognizable reference to the real world. These ideas are discussed more thoroughly in the last part of the paper. Here, however, it is said that there are many words in a child's early vocabulary, which are abstract – without any connection to directly accessible referents. This is then interpreted as a proof for the poverty of stimulus (cf. supra). If this is true, however, one might wonder what is actually learnt by the child. It produces these words. Fine, but that does not necessarily mean the toddler already grasps its most essential meaning. If the child has often been exposed to such a specific "abstract" word, it is plausible to assume he has acquired it because of his efforts to imitate it. So, in conclusion, these arguments don't hold a lot of scientific value, to my opinion.

Nevertheless, the article also offers something more interesting: an investigation of language learning by blind children. After all, these children lack a great deal of extralinguistic context to which they can link words and sentences. This seems more worthy of investigation:

> … if extralinguistic experience provides the route to learning, a blind child should have maximum trouble with these terms (…) [that] refer directly to the sighted world. Nonetheless, (…) a congenitally blind child can acquire considerable sophistication with the sighted vocabulary (209).

On top of this, it is said that blind children's first language acquisition is also not seriously delayed or distorted, compared to that of their sighted age mates, and that the role of possible adjusted input circumstances by the caregiver(s) also doesn't account for the development of their linguistic knowledge. If this is true, then this argument has to be seriously taken into account.

Another argument comes from the domain of biology. Within this point of view, language acquisition can be accounted for in terms of instinct. After all, instinct is a form of innately guided learning and therefore compatible with Chomsky's viewpoint of innateness. For this, reference can be made to the article *Learning by instinct.*[5] In this article, it is presented that learning by instinct is found "at all levels of mental complexity" in the animal kingdom. This statement is then illustrated with several examples, especially in bees and birds. Examples of instinctive behaviour in animals are widely illustrated in this article: bees' innate recognition of flowerlike objects is discussed in terms of their odour, colour and pattern, fear for predators is regarded as a blind kind of fleeing from death – a concept of which they can't have any mental representation, and song learning in birds is described in the functional context of recognizing others of the same species, luring a mate etc. It is then claimed that generalization can be made to primates and mankind for this, even when it concerns the faculty of language.

This claim seems well worth considering. Besides, instinct is something that can't be simply disregarded. It is a part of biological reality. The question remains, however, if the faculty of language should be regarded as such. Now, for all I know, instinct is something that is usually related to *survival*, and this at two levels: that of the individual and that of the species. For the individual, this would mean self-preservation (fear of enemies, food, shelter, etc.) For the propagation of the species, it means the sexual instinct. But can the faculty of language really be regarded as a necessity for survival? The line between instinctive learning and the development of knowledge has to be drawn somewhere. One might ask whether there really

---

[5] Gould, J.L., Marler, P. 2004. "Learning by instinct". B. Lust & C. Foley (eds.) *First Language Acquisition: The Essential Readings*. Massachusetts Institute of Technology, 190-207.

is an instinct to use language as such, or more of an "instinct to imitate", which enables the development of language along with developing physical skills.

Another observation is how song learning in birds is strategically discussed last in the article. I say strategically, because the jump to human language seems smaller in this case of presumed instinctive behaviour. After all, they both involve sound and some form of communication. However, this parallel can be seen as a legacy of romantic literature. In not any way is the singing of birds as complex as human language, how ever diverse it might be. Such an analogy cannot really claim any incontrovertible scientific truth. Besides, one can also state that birds' singing is a mere production of sound, which may have some basic communicative function, but not at the level of actual conversation. Even if we're going to make an analogy between bird and man regarding their sound production, then could we not link a bird's singing to responses to environmental conditions? Do human babies not cry? Do people not laugh? Do people not grunt? Do people not shout when they're scared or hurt? Do they not chatter their teeth when they're cold? These are all sound-producing behavioural patterns that can certainly be regarded as imprinted. Now, birds' high-pitched, melodious sounds might seem very communicative, but those are simply the sounds at their disposal because of the physical construction of their vocal cords. So, the analogy could also link "bird songs" with imprinted sound patterns of the human being, like the cry, the laugh and the grunt. When we use Chomsky's notion of the "Martian scientist", studying the human race, might that Martian not interpret the cry of a human baby as an innately triggered "song" to communicate several situations of discomfort? Now, I don't claim these hypotheses to be on the right track. They merely serve the purpose of offering an alternative to continue the discussion. I think the question of instinct is quite significant and demands some more empirical investigation, as to where to draw the line.

III. Recontextualizing Linguistics

3.1. The Chomsky-Piaget Debate

In this chapter, I'd like to provide a background for current recontextualizing linguistics. To do this, we have to go back roughly thirty years in time, more specifically to 1975. In that year, there has been a very well-known debate in linguistics between Chomsky and Piaget, concerning the "innate fixed nucleus" in generative grammar. It was part of the nature-nurture controversies at the time. Of course, Piaget was certainly not the first to link language with its context. Before Chomsky's generative grammar, there already was a legacy of behaviourism in American Structuralism, influenced by Bloomfield. Piaget could already appeal to its achievements in stimulus-response schemata. However, I'd like to use this debate as a background in history, because it is highly representative of the issues on which this paper wants to reflect. Reference also has to be made to the article "*Language and Learning: The Debate between Jean Piaget and Noam Chomsky*". [6] All quotes in this chapter refer to this article. Now, this article takes the form of some kind of conversation. Piaget and Chomsky are given the chance to express their ideas in turn. So, it really becomes a discussion in which arguments are proposed and refuted. This is done in three main parts, which will be analysed separately in their argumentation. The aim of this chapter is to offer a critical analysis of both Chomsky's and Piaget's viewpoints, as expressed in this article.

In the first part, Piaget offers an outline of his epistemology on psychogenesis. This is important to understand his reasoning further on. Of course, his viewpoints do not coincide with "preformationism", also referred to as "a priorism" or "innatism", but he also doesn't support a radical empiricism. He calls his personal framework "constructivism". In the development of knowledge he distinguishes successive stages. These are the sensorimotor stage from birth to age 2, the preoperational stage from ages 2 to 7, the concrete operational stage from ages 7 to 11 and the formal operational stage around the age of 11 to 12. He digresses on concepts like abstraction and generalization, but when it comes to innateness, only the sensorimotor period is relevant. He does, however, offer an interesting dichotomy in the interpretation of his own constructivism:

> The problem is (…) to choose between two hypotheses: authentic constructions with stepwise disclosures to new possibilities or successive actualisation of a set of possibilities *existing from the beginning* (66)

This reflects the distinction between the ontogenetic and the fylogenetic approach in Chomsky's notion of competence or "I-language". Piaget uses mathematics as an example: it can either stem from human constructions or originate in "a Platonic and suprasensible universe" (66) as an actualisation of the set of all possibilities. In the second sense, it has always "been", latent, as some sort of possibility. This second approach corresponds to Chomsky's notion of the faculty of language. It would be genetically represented in the brain as one of several possibilities in the developing human mind, and will come about in the right circumstances (which are usually always there). Piaget, however, discards this second interpretation and puts more emphasis on an ontogenetic approach of language acquisition. He refers to a "more essential" mechanism: that of the auto-regulation of the individual. In this view, language arises as a "necessity" in each particular individual, after a succession of

---

"constructions" in the mind. So, he has a rather functional idea of the emergence of language in an individual. He is radically different from Chomsky in his conception of language.

Nevertheless, Piaget claims to be in agreement with Chomsky for the most part. He agrees the origins of language necessitate some sort of "fixed nucleus". Also with regard to the biological roots of language, their views coincide. Piaget says that the sources of knowledge "are to be sought at the level of the organism, since a succession of constructions could not admit of an absolute beginning"(69). For Piaget these so-called "biological roots" refer to auto-regulation, and it would be this mechanism that brings about language after a succession of cognitive constructions. Therefore, he gives two arguments to counter Chomsky's innate fixed nucleus. As a first argument, he claims that language, as a product of biological evolution, would be "biologically inexplicable" (69). He does not see how the random mutation of evolution could bring about something as complex as language. This rather seems to be a very functional view on biological evolution and more of a critique on Darwinian evolutionary theory. His second argument, on the other hand, is a little more founded. He calls the fixed nucleus of the faculty of language "the necessary result of the constructions of sensorimotor intelligence, which is prior to language and results from those joint organic and behavioural autoregulations" (70).

Chomsky first replies by reasserting his beliefs in a fylogenetic notion of competence by referring to an "intrinsic competence" (72). In reply to Piaget's arguments, he is not shy to express that they don't impress him very much. In refuting the first argument of "biological inexplicability", he exploits its basic weakness: that it only refers to the "gaps" of Darwin's evolutionary theory.

> Although it is quite true that we have no idea how or why random mutations have endowed humans with the specific capacity to learn a human language, it is also true that we have no better idea how or why random mutations have led to the development of the particular structures of the mammalian eye or the cerebral cortex (73)

The second argument is more worthy of considering, but Chomsky claims that the constructions of sensorimotor intelligence do not account for "the phenomena of language that demand explanation" (73). Although one might expect him to give some more information about these "phenomena", he starts to dwell on other matters. One of these matters is how people often criticize his defence of innateness as "begging the question".[7] Although he tries to contradict this critique, he uses this rhetorical trick already on the next page:

> …a <u>neutral</u> scientist should approach cognitive structures such as human language more or less as he would investigate an organ (…) seeking to determine: (1) its character in a particular (…); (4) the course of its development in the individual; (5) the <u>genetically determined basis</u> for this development … (74)

This stretch of text shows how Chomsky's insistence on a biological approach to language somehow already implies innateness for the faculty of language. The reasoning goes as follows: biology – evolution – DNA – genetically determined – intrinsic element – innate. This quote goes even further by claiming that a neutral scientist would have to search for the "genetically determined basis" of the language faculty, as if it is an inescapable fact that it

---

[7] A fallacy in which the premises include the claim that the conclusion is true somehow (directly or indirectly)

actually is genetically determined. Piaget, however, does not use this as a counter-argument in this part, so Chomsky gets away with it. Do notice that I am nót contradicting Chomsky's claims for innateness here, but only the method of his defence of his ideas.

The second part of the discussion in the article comprises the pages 85 to 90. Here Piaget starts off again with some arguments to object to Chomsky's innate fixed nucleus. He believes Chomsky proposes innateness of the language faculty because an explanation for the seeming universality of language in humans might appear more logically sound if it is "firmly rooted" (86). We might call his first argument "redundancy" for he says that "… innateness is not needed to ensure the formation and the stability of this nucleus; sensorimotor intelligence is sufficient for that"(87). Relying on his constructivist view on the acquisition of language he even calls innateness of the language faculty "useless" (88). For a second argument he falls back on his theory of constructivism. He claims there are six successive stages in the years between birth and the age of 2, characterized by "schemes of action". It would be only at the last of these six stages that language begins (and necessarily *can* only begin at that point). For a last argument, he unfortunately starts off again with anti-Darwinian conceptions of evolution.

> …a mutation necessarily occurs at random; therefore, if there were innateness, reason and language would be the result of selected accidents (…) I absolutely refuse, for my part, to think that logico-mathematical structures would owe their origin to chance; there is nothing fortuitous about them. These structures could not be formed by survival selection but by an exact and detailed adaptation to reality (87)

He seems to be unable to accept the notion of mere chance in the evolutionary process. He sees too much purposefulness in evolution, and Piaget did not even stop there in the article. Further on, he even uses Lamarckian ideas of evolution, which are completely refuted today. This means he believes that acquisitions made by the phenotype might engender reconstructions of the genotype. This is completely untrue, as we know today. On top of that, he should not be making such statements, for a reconstruction in the genes on behalf of the language faculty would mean Chomsky is right. Paradoxically, however, Piaget was somehow ahead of his time by saying that "genes or loci could be discovered that would allow the reality of such innateness to be demonstrated". After all, one can't help but be reminded of "Broca's area", discussed in the second part of this paper. However, he does try to falsify this claim for innateness with the concept of "phenocopies", another obsolete Lamarckian idea. He ends up his pleading with the following words:

> …there is no clear and total opposition, with well-defined boundaries, between what is innate and what is acquired: all cognitive behaviour includes a portion of innateness, in its functioning at least, whereas the structure appears to me to be constructed bit by bit by autoregulation (88)

At first sight, this might appear to contradict his argumentation against an innate fixed nucleus for language. This is not the case. He believes the functioning of our cognitive system must have some element in it that is innate. Language, on the other hand, he considers to be a construction via autoregulation out of these more fundamental, partially innate mechanisms.

Chomsky does not reply anything new to these arguments. With regard to the self-regulatory mechanisms of the individual and the sensorimotor intelligence, he merely paraphrases he own previous defence:

> I know of no reason to believe that the principles of sensorimotor construction or any other general developmental methods will suffice to account for all properties of the fixed nucleus (90)

The last part of the discussion comprises the pages 90 to 96. Once again, Piaget starts off, and Chomsky once again gets the last words. In this last part, Piaget finally manifests himself as a good thinker in terms of stimulus and response. He gives an accurate description of necessary developments in cognitive reasoning that would successively amount to the acquisition of language. Some of these necessary cognitive developments involve comprehension, recognition, evocation, representation and the coordination of schemes. These would all amount to the constitution of sensorimotor logic in the infant, which is necessarily to be presupposed for the semiotic or symbolic function to kick in, according to Piaget. He also explains how language is only a particular case, where semiotic reasoning is necessary. He illustrates this point with other cases of semiotic functioning, like symbolic play and deferred imitation. He concludes once again that it is unnecessary to presuppose an innate fixed nucleus to explain the acquisition of language:

> … the symbolic function, which is a necessary derivative of sensorimotor intelligence, allows the acquisition of language, and this is the reason why, for my part, I do not see the necessity of attributing innateness to those structures (subject, predicate, relationships, and so on) which Chomsky calls the "fixed nucleus." (92)

He also makes some short remarks afterwards. The first is the observation of the synchrony of language and the semiotic function. This seems kind of idiotic, for language simply *is* the semiotic function at work, but if this synchrony also applies to these other forms of semiotic functioning he has mentioned, there might be something to it. His last comment is the question why Chomsky restricts this innateness to language alone, and does not introduce it to more general cognitive functioning. This last question will remain unanswered in the article.

In the last pages Chomsky seems to be the "winner". He has remained consistent, never digressed as much as Piaget, and in the end his arguments still stand. However, this is not in the least because he got the last word in the article. At the end, he introduced a last argument to bring down Piaget's constructivist ideas. This last argument started from the assumption that "insofar as those sensorimotor constructions are impeded, the intelligence that leads to the acquisition of language should also be impeded" (95), if Piaget was on the right track. Paraplegics or blind children, however, do not show any noticeable impairment in their language development, although their sensorimotor logic is highly limited. Eventually, there is no more response by Piaget on this account, as if this argument had made him lost for words. Chomsky comes off as the better orator, and is not shy to exploit this position of authority, by discarding Piaget's viewpoints: "There is no reason to believe it at the moment, to my knowledge"(96).

Nevertheless, I believe there is conceptually more to Piaget's claims than meets the eye, or at least the eye of Chomsky. To illustrate this, I'd like to refer to Piaget's very last sentence:

> I have never denied that there was something innate as far as functioning (but not structure) is concerned; no one has ever been able to make an intelligent man out of an idiot (93)

Unfortunately, Chomsky's reaction to this goes:

> … that is inconsistent with your other point of view, because if there are *elements of innateness* involved in the structure of language, then it is false that it is unnecessary to postulate *innate structures*. We can't have it both ways – it is one or the other. (93)

I believe Chomsky wrongly interpreted what Piaget meant by this. Piaget's last sentence struck me as a reference to "ex nihilo nihil fit".[8] In this case, "receptivity for knowledge cannot come from nothing". After all, he talks about "functioning". A newborn receives a lot of stimuli from his environment, through senses like sight and hearing. These stimuli activate certain parts of the brain, resulting in the emergence of cognitive processes. Piaget believes, then, that it is these cognitive processes that necessarily lead (through a series of mental "constructions") to the acquisition of language in each particular individual. However, we cannot explain how this biological constitution of the brain allows for this receptivity for knowledge and, eventually, the creation of what we call "the mind". It is for reasons like this, I believe, Piaget proposed there was a need to presuppose something innate as far as functioning.

At this more basic level, I also think Piaget's and Chomsky's ideas match. After all, Chomsky also talks about "our ignorance (…) of the physical basis for mental structures"(85). Besides, he ends up characterizing his own theory as "the null hypothesis" (96):

> … if there are constructions of sensorimotor intelligence of particular concepts that develop in particular ways, then I would think, as Fodor argued, that *in those cases too we will just have to assume that the concepts themselves are essentially innately determined, since we know of no other way of accounting for their acquisition.* (96)

In fact, Chomsky touches upon the limits of science with a statement like this. A theory always has to start from somewhere, so it necessarily comes forth from *some* presuppositions. We can for example not account for the fact that a specific constitution of molecules brings along an *agitated* state, called life. Whenever these theories try to go this deep into the very essence of things, they'll always stumble upon this insolvable "question of life" in the end. This is where man necessarily has to leave science and resort to philosophy.

---

[8] Nothing comes from nothing

3.2. Current Criticisms on Innateness

➢ *Language as cognitive development*

Piaget's constructivist view on the development of language still has a great influence on linguistics today. His emphasis on sensorimotor knowledge as a precondition for the formation of language is generally accepted in recontextualizing linguistics. Modern theories uphold that prelinguistic and embodied concepts of sensorimotor knowledge provide the grounding for a child's early vocabulary. In a next step, these early words would provide the basis for the acquisition of "later" words in a child's vocabulary. Finally, they would even enable the emergence of an early grammar. So, it is argued that each stage provides the necessary foundation for the next. This is, without a doubt, a constructivist view on the development of language. It opposes Chomsky's hypothesis of an innate "structure" of language. The absolute basis would remain this prelinguistic conceptual knowledge. After all, grammar would be impossible to learn without meaning representations. This refers to the critical argument of "learning a language by listening to the radio" (McClelland).

These notions of sensorimotor knowledge and constructivist ideas on language development have been maintained since Piaget by people like Lakoff, Johnson, Bloom and Langer. They claimed that this sensorimotor knowledge mostly concerned objects and their physical properties in the beginning. This would account for the fact that children's earliest vocabulary almost entirely consists of nouns. After all, they tend to refer to "salient" objects that are rooted in direct embodied experience. So, they refer to objects that have been physically and perceptually accessible to them. This first stage of early vocabulary is claimed to emerge between 10 and 12 months of age. When it comes to verbs at this stage, only the most "concrete" ones would make it into their vocabulary (Gillette et al., 1999). The next stage is what one might call a "lexical boom". This emerges around 20 months of age. Within this constructivist frame of thought this is possible because of the presence of "necessary foundations". In this case that would be a critical mass of about 50 words in the child's lexicon. This would allow for "consistent sentence formats" in the child's further acquisition of words (Smith, 1999). These formats take the form of "This is a _____". Bloom has referred to this phenomenon as "fast-mapping". This involves situations where the child is confronted with an utterance, of which only one word is unknown. These kind of situations, in combination with the necessary prior knowledge (the identifying, referential function of the phrase: "This is a _____"), obviously allow for this "lexical boom" to take place. The next stage, at about 28 months of age, is commonly referred to as a "grammar burst". This phase's necessary foundation would be a critical mass of some 300 words. Here the main syntax of the first language is obtained in a rapid fashion. Even further in the development of language, more abstract words are obtained via their linguistic context, so through their relation to other known words. This anomaly has sometimes been called the "propagation of grounding". The choice of this name is not an unimportant detail, for it shows how adult language still bears directly on the earliest acquired (grounded) words of the lexicon, and emphasizes once again the importance of sensorimotor knowledge.

Recently, there have also been experiments trying to demonstrate the validity of these viewpoints. Howell, Jankowicz and Becker, for example, made statistical analyses of artificial environments for language learning, using SRN-models (Simple-Recurrent Network)[9]. In simulation experiments such models were confronted with complex language

---

[9] Howell et al. 2005. "A model of grounded language acquisition: Sensorimotor features improve lexical and grammatical learning". *Journal of Memory and Language*. 53.2,aug. 258-276.

corpora. The input of these corpora would have been sufficiently representative of the input a child, learning its first language, might get. So, they claim the extrapolation to real life language acquisition would be scientifically sound. Now, their results have shown how in such artificial models of language acquisition the inclusion of sensorimotor features improved performances of both lexical and grammatical learning. So, these experiments have confirmed that sensorimotor knowledge really does make a difference, when it comes down to language acquisition.

> *Broca's Area*

Broca's area is a part of the human brain involved in processing and generating human language. It gave rise to a neurobiological perspective on the acquisition of language. It has already been discussed in this paper from the point of view of modern generative grammar (chapter 2.4). Cognitive Linguistics, however, offers a different interpretation and explanation of phenomena involved with Broca's area. In general terms, they propose an epigenetic approach to account for the linguistic specialisation of this brain area. This means they deny the idea that it proves the genetic "hard-wiring" of the faculty of language. Instead, they believe the human brain develops like this, due to maturational events triggered by "phenotypical influence", or in other words the environment. So, they relate the linguistic specialisation of Broca's area to the context in which the individual is placed.

The main argument of Cognitive Linguists for this is the "overlap of activation" in that part of the brain, of which Broca's area is a part, i.c. the inferior frontal gyrus. PET and fMRI-studies have shown that impulses activate this part of the brain for tasks *unrelated* to language, too. Now, it is already discussed how sensorimotor knowledge plays a vital part for the development of language, and it is shown in these experiments that it is exactly this visuomotor and audiomotor functioning that activates this part of the brain as well. So, it appears that in our brain the capacity for language is embedded within these functional components, crucial for language acquisition. These functional components involve motor imagery, object manipulation, motor preparation, digit sequence learning and complex motor planning. This simply cannot be a coincidence. Also non-phonological auditory tasks, like passively observing environmental sounds, are activated in close proximity. All of this reveals a functional structuring of the brain by strong and close links between related cognitive functions, which is probably a general principle in the structure of our brain as a whole:

> A biologically promising model of the role of Broca's area in language (…) can be
> founded on this region's unique potential to link non-linguistic component processes of
> lexical acquisition in the developing brain (336)[10]

So, Broca's area is simply suited for participation in language acquisition, because of its architecture and connectivity, and the brain therefore develops in this way. Another important aspect, regarding this, is the "pluripotentiality" of brain tissue in the developing brain. This summons the notion of the human baby as a "clean slate", more or less the opposite notion of Chomsky's poverty of stimulus. Brain cells show the potential to develop many different functional specializations. Besides, Broca's area is *not* functionally dormant before the acquisition of language around the age of 10 to 12 months. It is the place where functional components are activated that provide the ground for language to develop later,

---

[10] Müller, R. & S. Basho. 2004. "Are non-linguistic functions in "Broca's area" prerequisites for language acquisition? FMRI findings from an ontogenetic viewpoint". *Brain and Language.* 89.2. 329-336.

like sensorimotor functions. Nevertheless, this remains a matter of debate to this day. There is no consensus about the role of Broca's area between Chomskyan linguists and cognitive linguists.

> ➢ *Science and Philosophy*

When Chomsky's notions of the innateness of the language faculty are under discussion in recontextualizing academic circles, Chomsky's generative grammar is often labelled a pseudo-science, which holds no real scientific value. His claims are dismissed as being philosophical in nature and no more than mere speculation. Chomsky's rhetoric is characterized as a means to impress and intimidate, and therefore create for him an "aura of scientific authority". So his claims are discarded as unscientific: "Chomsky defends his 'armchair' speculations with a rhetorical flourish worthy of any ideologue unwilling or unable to submit to the disciplines of science" (Cant, 10).

Whenever the scientific status of Chomsky's theory of innateness is criticized, it is said that his only real argument for this is the so-called "poverty of stimulus". In a next step this argument is completely dismissed. After all, it is only founded on a subjective impression. Is there really a poverty of stimulus? This argument merely stems from some sort of admiration for "the miracle of language acquisition" as something mysterious. However, there would be no convincing scientific evidence for the assumption of such underdetermination for language acquisition. Cognitive linguists refer to the baby's position for this as a "clean slate". From the point of view of the adult, there might seem to be an underdetermination, but his condition as an adult, who has already acquired a language, is also completely different.

Chomsky's "grammatical tradition" or, more specifically, the isolation of the grammar from its context is often highly criticized. With regard to this, Cant calls him narrow-minded:

> … distinctness is often not an all-or-nothing business. A complex phenomenon may have a number of features, which distinguish it from other phenomena, while at the same time it may have other features in common with them. Chomsky (…) seems to ignore such a possibility (Cant, 4-5)

Pär Segerdahl, although a professor of philosophy, also discards these Chomskyan notions of innateness:

> Chomsky's grammatical perspective is *doomed* to make language acquisition look like a miraculous feat, since it conceals how linguistic practices and reactions develop in the child's way of living *on the basis of already acquired practices and reactions* (…) since Chomsky neglects this practical aspect of a child's evolving speech, he does not observe how the child's improved acting and speaking plays a role in the child's further development. *We learn to speak from within our own evolving language.* (Segerdahl, 14)

Finally, it also needs to be mentioned that the success of generative grammar ever since Chomsky originated it, has led to some frustration in several people around the world, who did not agree with his theory. The tone can sometimes become a little aggressive, and the target then becomes Chomsky himself and the followers of his doctrines. I believe this should be avoided to keep the discussions relevant, though it happens every now and then. Richman, for example, calls Chomskyan linguistics "an intellectual arrogance and elitism that thinks you can understand the whole of language entirely through introspection." (7-8)

3.3. Michael Tomasello and Usage-based Theories

In the field of functional and cognitive linguistics, new kinds of approaches to study first language acquisition have been presented in the last two decades. These were usage-based approaches as proposed by Langacker, Goldberg and Croft. Today, Michael Tomasello is one of the most well-known promoters of these usage-based models to study first language acquisition. Besides, he's one of the most outspoken critics of the theory of Universal Grammar in generative linguistics. Concerning the faculty of language, his viewpoints go completely against those of Chomsky. Therefore I thought it worthwhile to dedicate this last chapter to the usage-based model Tomasello has proposed to explain first language acquisition. Before going into his theories, however, I'll provide an outline of his basic problems with Universal Grammar.

One problem with Universal Grammar Tomasello refers to as "the linking problem". This means that it is difficult to make links between this universal grammar and any given particular language. There would be "too much variability across languages for any static and innate look-up table to function in the way it would need to solve the problem of linking". Another problem with Universal Grammar for Tomasello involves mainstream ideas in the philosophy of science. These emanate from Popper's ideas concerning "conjectures" and "refutations". They demanded scientific theories and hypotheses to be falsifiable, so that these could be put to the test. This was necessary for the dynamic of science. After all, science shouldn't be perpetually confirming existing theories, but rather constantly challenging them. This way, theories could be adjusted or refuted, whenever empirical observation made it seem necessary. Now, considering this point, Tomasello finds Universal Grammar to be "an extremely weak hypothesis". There are, after all, only very few precise formulations of what Universal Grammar exactly *is*, what it embodies. It hardly seems a testable hypothesis. On top of that, it seems that there's a lot of disagreement about the nature of Universal Grammar in the field of generative linguistics itself. There has been a proliferation of linguistic inquiry as to its form: lexical and functional categories, X-bar syntax, *wh*-movement, c-command, merge, principles and parameters, recoverability, double articulation, argument hierarchy etc.[11] So, as to the form of this proposed innateness, there's no agreement. This makes it hardly a consistent hypothesis, which makes it as a consequence difficult to contradict. If one would try to, however, there are of course some basic arguments of generative grammar to be dealt with. There are (1) the stipulated universal characteristics in all natural languages (like X-bar syntax and parameters), (2) the poverty of stimulus argument and (3) some empirical phenomena concerning blind and aphasic people. As to the so-called "universals" in language, Tomasello claims they simply don't hold when taking into account the more than 6000 natural languages in the world. As opposed to the "universality" of X-bar syntax, many languages would have a non-configurational pattern of phrase structure organization. Also the most well-known proposed parameters for Universal Grammar would impose an Indo-European structure on the world's languages:

---

[11] Tomasello, M. 2004. "What kind of evidence could refute the UG hypothesis?" *Studies in Language* 28.3, 642-645.

> … Once we get away from European languages on the basis of which this parameter [the pro-drop parameter] was formulated, the correlations simply do not hold (…) the head-direction parameter (…) fares no better in cross-linguistic perspective [12] (187).

Tomasello also argues there would be no poverty of stimulus if language is regarded as "a set of symbolic instruments for directing the intentional and mental states of others" and if children are granted to possess some basic cognitive and pragmatic skills, like categorization, analogy, statistical learning etc. Tomasello (2005) says:

> If one takes function into account (…) there is no poverty of stimulus since even the most abstract syntactic principles from generative grammar may be understood as emanating from the language users' sensitivity to the communicative function of the pieces of language she is using. (191)

Finally, he also discards the empirical phenomena concerning blind and aphasic people as arguments for an innate Universal Grammar, because they could be equally well understood in terms of "biological adaptations for more general skills of human cognition and communication". So, all in all, he thinks Universal Grammar comes in short as an explanation for first language acquisition. He believes his usage-based model of language acquisition to be much more promising, which I will now begin to discuss.

Now, research has shown that most of children's early language is *not* based on any grammatical abstractions. Experiments with novel verbs in children's vocabulary also show a highly limited productivity with syntactic constructions, so children don't seem to assimilate these new verbs to some higher, abstract level. This goes against the ideas of Universal Grammar. Therefore, Tomasello believes that the early language of children has traditionally been regarded from an all too "adult" perspective. He proposes a different methodology: observation of actual language use in actual communicative events. Following the conclusions of recent research and experiments, this might show how accumulated linguistic experience *can* actually account for the emergence of language, without there being a poverty of stimulus. More particularly this boils down to a more thorough examination of the early use of language in children. There is however, as Tomasello argues, a basic necessity before language can develop. This is the "understanding of communicative intentions":

> … it is only if a young child understands other persons as intentional agents that she can acquire and use linguistic symbols – because the learning and use of symbols requires an understanding that the partner can voluntarily direct actions and attention to outside entities (675).[13]

Yet, this ability alone is still not enough to account for a sudden emergence of language. Experiments have shown that non-human primates (great apes) and some children with autism also have this basic ability to understand communicative intention. For linguistic communication to emerge, therefore, this comprehension of communicative intention needs to be experienced in the context of an already familiar form of life (the adult) as a functional grounding. Bruner (1983) refers to this specific kind of context as "joint attentional formats":

---

[12] Tomasello, M. 2005. "Beyond Formalities: The case of language acquisition" *The Linguistic Review 22*, 183-197.

[13] Tomasello, M., Carpenter, M., Call, J., Behne, T., Moll, H. 2005. "Understanding and sharing intentions: The origins of cultural cognition." *Behavioral and Brain Sciences* 28, 675-735.

Bruner (…) provided evidence that children's comprehension and learning of language is scaffolded by "joint attentional formats" in which both child and adult have a common understanding of some delimited domain of experience (32). [14]

This is a capacity we can find in human 1-and 2-year-olds, but neither apes nor children with autism have the motivation or capacity to share things psychologically with others. So, we can regard these joint attentional formats as one of the most fundamental basics for language acquisition. When that knowledge and ability is present in the human child, the "decoding" of language can begin. Starting from that point, Tomasello argues that the most fundamental psycholinguistic unit of language must be the *utterance* and based on these premises, he has built a whole theory on the different stages of development in first language acquisition.

An essential characteristic that is put forward at first is *imitative learning*. This is a necessary behavioral pattern if language acquisition is to be solely based on experience. The usual argument Tomasello and other functional and cognitive linguists use to defend this claim, is how 3-year-olds would still only have very limited ability to go beyond what they have learned, or in other words: what they have actually heard from others in past usage events. On the other hand, there are also claims that this is simply not true and that 3-year-olds very often show some creative input that can't be based on experience. An example for this would be: "Her open it". Because of its obviously ungrammatical structure, this is of course something that is unlikely to have been uttered by an adult speaker at some point in the experience of the child. Tomasello then explains these kinds of utterances to be an incomplete reproduction of something that might well have been heard. In this case, that could be for example: "Let her open it".

Now, given the context of joint attentional formats and imitative learning, Tomasello refers to the first linguistic creations by the child as *holophrases*. He calls these holophrases attempts to imitate complete adult utterances, which in actual fact often only manage to produce just one linguistic element. So, considering joint attentional formats, these holophrases are often attempts to designate something particular in a given context. In fact, they are a descriptive concept for "baby psychology". It is argued they can take many forms, not just corresponding to single words in "adult language". "Frozen phrases", for example, start off as holophrases and are eventually broken down into constituents: gimme-that, my-turn etc. That is when grammar begins to emerge. After all, this division into constituents demands not only a conceptual comprehension of an adult utterance as a whole, but also an insight into the functional role of its different linguistic elements. Somehow, it demands the child to make a "functionally based distributional analysis". In a next step – when the child's early grammar has been developed – it displays a typical functional asymmetry. A child's early multi-word speech very often consists of fixed expressions that contain one or more variable slots, which can be filled by several linguistic elements. Tomasello calls these *utterance schemas*. However, this raises the question of what their underlying psycholinguistic representations look like. Are these concrete, item-based utterance schemas, as his usage-based model proposes, or are they the application of the innate, abstract rules of Universal Grammar? A distributional analysis seems to show that these early grammars are completely dependent on experience. Tomasello calls them "an inventory of verb-island constructions". [15] This refers to the fact that every verb, learned by experience, seems to have

---

[14] Tomasello, M., Carpenter, M., & Liszkowski, U. (in press). "A new look at infant pointing" [electronic version]. *Child Development*. 1-46.
[15] Tomasello, M. 2000. "First steps toward a usage-based theory of language acquisition" *Cognitive Linguistics* 11-1/2, 61-82.

a unique set of utterance schemas at any given developmental period. On top of that, there was the observation of *entrenchment*: something that had already been heard multiple times did not change anymore in its reproduction. It somehow restricted or disabled further grammatical creativity. As opposed to newly learned verbs, experiments have shown that there is no overgeneralization in frequent verbs. So, eventually, it seems to come down to an item-based organization in language learning, nurtured by experience.

To explain the created slots, reference is made to "observed speech variation" in already familiar utterance schemas. *Frequency* is very important when it comes to this. Tomasello makes a relevant distinction between *token frequency* and *type frequency*. Token frequency is the kind of frequent use that helps an expression to become entrenched. This leads to fluency in using such an expression. Type frequency refers to the different forms in which an expression is used. This determines the productivity of the expression. So, it is hypothesized that children make constructional analogies when they observe similarities in form and/or function. A critical mass of examples might make it possible for this kind of abstraction to be made.

The main conclusion here is that language acquisition develops ontogenetically and is not triggered by some innate faculty of language. The relevant general cognitive processes are intention-reading and pattern-finding, according to Tomasello. In contrast to the theory of Universal Grammar, this usage-based approach also offers an interesting research domain for the future by this. After all, how does one account for the actual existence of language in itself, if it is something to be learned by experience? How did it come into being? The general proposal in this view is, then, that linguistic competence in the human race must have evolved over time, historically. Concerning this, I'll give the last word to Tomasello himself:

> [linguistic constructions] are constructed by communities of people historically, via processes of grammaticalization, and re-constructed by individual children ontogenetically. (…) Universals of language structure emerge not from an innate universal grammar, but rather from the simultaneous interaction of universals of human cognition, communication, and vocal-auditory processing in the process of grammaticalization (192). [16]

---

[16] Tomasello, M. 2005. "Beyond Formalities: The case of language acquisition" [electronic version]. *The Linguistic Review 22*, 183-197.

Conclusion

We have seen how Chomsky had introduced the framework of generative grammar to the field of linguistics in the 1960s. He shifted the perspective from behavioral patterns to a naturalistic approach. To account for language acquisition, however, he stipulated some form of innateness. In his view there was a poverty of stimulus: experiential and environmental nurture alone were not sufficient to explain the emergence of language in human children. Over time, generative grammar began to isolate the grammatical component of language more and more, resulting in a "Universal Grammar", common to all languages and all of mankind. The structure of language in general (its grammar) was called genetically determined. Today, frameworks within generative grammar, like "Principles and Parameters" and the "Minimalist Program" still uphold these ideas, claiming that nurture alone cannot fully account for language acquisition.

The 1980s, on the other hand, saw the emergence of another framework in linguistics: functional and cognitive linguistics. Regarding the faculty of language, this discipline was not in agreement with the axioms of generative grammar. Basically, it discarded the theory of Universal Grammar as non-scientific. On the basis of experiments, functional and cognitive linguists have tried to build up evidence for the redundancy to stipulate an innate component of the language faculty. People like Michael Tomasello have created usage-based models to both describe and explain the development of language in children, based on its context. Here, the theoretical foundations of language acquisition only rely on the presence of some more basic cognitive abilities in the human child. These more basic abilities are things like imitative learning, intention-reading and pattern-finding. They don't require presupposing an innate form of language.

Somehow, this seems like an endless discussion. The most fundamental axioms of these subdisciplines within linguistics are at odds. Yet, after carefully investigating both views, the points made by cognitive linguists appear to be more valid to me. First of all, the poverty of stimulus argument seems to be quite a subjective foundation for a "scientific" discipline, although it also appears quite reasonable when Chomsky brings out his rhetoric skills. Of course, there *is* a necessity to claim some form of "innate" receptiveness for knowledge in general, which has its biological foundation in the brain of the human child. However, if the emergence of *linguistic knowledge in specific* can be described as the consequence of more basic cognitive abilities, there is no reason to presuppose a universal grammar. In its methodology, cognitive linguistics seems to be more compatible with the fundamentals of science. On the other hand, this does not mean that generative linguistics has to fall apart like a house of cards. Over the years it has brought highly significant contributions to the *description* of human language, contributing to other domains as well in the process, like computer linguistics and artificial intelligence, which use X-bar theory. When it comes to the *explanation* of human language, however, I believe cognitive linguistics to be more along the right track. I say "on the right track", for there are still a lot of questions to be investigated. Can we make a model of how language might have evolved historically? How do we account for language development in blind children, in terms of joint intentional formats? What about the development of Broca's area in the brain of a human child, as a response to contextual impulses? While generative grammar seems to have come to a standstill, these kinds of questions hold the promise of possible progress in the field of cognitive linguistics.
There is still a long way to go …

References

Andor, J. 2004. "The Master and His Performance: An Interview with Noam Chomsky". *Intercultural Pragmatics* 1.1, 93-111.

Behne T., Carpenter, M., Tomasello, M. 2005. "One-year-olds comprehend the communicative intentions behind gestures in a hiding game" [electronic version]. *Developmental Science* 8.6, 492-499.

Bloom, P. 2000. *How children learn the meanings of words*, Cambridge University Press, Cambridge.

Cant, P. (n.d.). "The reasonable and the unreasonable in Chomskyan linguistic theory". Retrieved May 19, 2007, from: http://elvis.rowan.edu/~bps/beyondChomsky/paperSubj.html

Chomsky, N. 1986. *Knowledge of Language: Its Nature, Origin and Use*. New York: Praeger.

Chomsky, N. 1995. *The Minimalist Program*. Massachusetts Institute of Technology.

Chomsky, N. 2004. "New Horizons in the Study of Language". *New Horizons in the Study of Language of Mind.* 3-18.

Chomsky, N. 2004. "Language as a Natural Object". *New Horizons in the Study of Language of Mind.* 106-133.

Chomsky, N. 2004. "Language from an Internalist Perspective". *New Horizons in the Study of Language of Mind.* 134-163.

Chomsky, N. 2004. "Internalist Explorations". *New Horizons in the Study of Language of Mind.* 164-194.

Dogil et al. 2004. "Where and how does grammatically geared processing take place – and why is Broca's area often involved? A coordinated fMRI/ERBP study of language processing" [electronic version]. *Brain and Language.* 89.2. 337-345.

Elman, J.L.1990. "Finding structure in time". *Cognitive Science* 14, 179–211.

Gillette, J., Gleitman, H., Gleitman, L., Lederer, A. 1999. "Human simulations of vocabulary learning". *Cognition* 73, pp. 135–176.

Gould, J.L., Marler, P. 2004. "Learning by instinct". B. Lust & C. Foley (eds.) *First Language Acquisition: The Essential Readings*. Massachusetts Institute of Technology, 190-207.

Howell, S.R., Jankowicz, D., Becker, S. 2005. "A model of grounded language acquisition: Sensorimotor features improve lexical and grammatical learning". *Journal of Memory and Language.* 53.2,aug. 258-276

Jackendoff, R. 2002. "The Architecture of the Language Faculty: A Neominimalist Perspective". *Filologiya.* 56.9.2. 157-189.

Landau, B., Gleitman, L.R. 2004. "Language and Experience". B. Lust & C. Foley (eds.) *First Language Acquisition: The Essential Readings*. Massachusetts Institute of Technology, 208-221

Langer, J. 2001. "The mosaic evolution of cognitive and linguistic ontogeny". M. Bowerman & S.C. Levinson (eds.) *Language acquisition and conceptual development*, Cambridge University Press.

Müller, R. & S. Basho. 2004. "Are non-linguistic functions in "Broca's area" prerequisites for language acquisition? FMRI findings from an ontogenetic viewpoint" [electronic version]. *Brain and Language.* 89.2. 329-336.

Musso, M., Moro, A., Glauche,V., Rijntjes, M., Reichenbach, J., Büchel, C., Weiller, C. 2003. "Broca's area and the language instinct". *Nature neuroscience*.6. 774-781.

Palmarini, M.P. 2004. "Language and Learning: The Debate between Jean Piaget and Noam Chomsky". B.C. Lust & C. Foley (eds.) *First Language Acquisition. The Essential Readings.* MIT Press, 64-96.

Richman, B. 2000. "Chomsky's Wonderland". Retrieved May 19, 2007, from:
    http://elvis.rowan.edu/~bps/beyondChomsky/paperSubj.html

Segerdahl, P. (n.d.)."Chomsky's Technical Notion of Language". Retrieved May 19, 2007,
    from: http://elvis.rowan.edu/~bps/beyondChomsky/paperSubj.html

Slobin, D.I. 2004. "Cognitive Prerequisites for the Development of Grammar". B.C. Lust &
    C. Foley (eds.) *First Language Acquisition. The Essential Readings.* MIT Press, 240-247.

Smith, L.B. 1999. "Children's noun learning: How general learning processes make
    specialized learning mechanisms". B. MacWhinney (ed.) *The emergence of language*,
    Lawrence Erlbaum Associates, New Jersey.

Tomasello, M. 2000. "First steps toward a usage-based theory of language acquisition"
    Cognitive Linguistics 11-1/2, 61-82.

Tomasello, M. 2004. "What kind of evidence could refute the UG hypothesis?" [electronic
    version]. *Studies in Language* 28.3, 642-645.

Tomasello, M. 2005. "Beyond Formalities: The case of language acquisition" [electronic
    version]. *The Linguistic Review 22*, 183-197.

Tomasello, M., Carpenter, M., Call, J., Behne, T., Moll, H. 2005. "Understanding and sharing
    intentions: The origins of cultural cognition." [electronic version]. *Behavioral and Brain
    Sciences* 28, 675-735.

Tomasello, M., Carpenter, M., & Liszkowski, U. (in press). "A new look at infant pointing"
[electronic version]. *Child Development*. 1-46.

<u>Samenvatting</u>

In de jaren '60 brak Chomsky met de heersende traditie in de toenmalige linguïstiek. Voordien werd deze beheerst door het Amerikaanse structuralisme, in de traditie van Bloomfield. Taalverwerving werd toen nog verklaard in termen van stimulus-en responsschema's. Chomsky pakte het echter naturalistisch aan en verschoof het perspectief naar interne mechanismen. In zijn generatieve grammatica stelde hij een aangeboren vorm van taalvermogen voor om taalverwerving te verklaren. Dit aangeboren taalvermogen was volgens hem genetisch gecodeerd in het menselijke ras, als een product van biologische evolutie. Het nam de vorm aan van een "universele grammatica", die de basis zou zijn van alle bestaande natuurlijke talen van de mens. Zijn belangrijkste argument voor deze hypothese is de zogenaamde "poverty of stimulus": de context van opvoeding en omgeving is niet voldoende om de verwerving van iets complex als een natuurlijke taal in slechts enkele jaren te verklaren. In de hedendaagse generatieve taalkunde staat dit maxime van aangeborenheid nog steeds overeind. In researchprojecten als "principes en parameters" en het "minimalisme" doet men nog steeds pogingen om deze gepostuleerde universele grammatica vorm te geven.

Naar het einde van het millennium toe, kwam er echter een nieuwe trend opzetten: de cognitieve taalkunde. Met betrekking tot het taalvermogen van de mens, ging deze tak van de taalkunde lijnrecht in tegen de opvattingen van Chomsky en de generatieve grammatici. Hun onenigheid maakt deel uit van het "nature-nurturedebat". In zijn kritiek op Chomsky, was Piaget reeds een voorloper van deze nieuwe tak in de taalkunde. Cognitieve taalkundigen beweren dus dat er helemaal geen "poverty of stimulus" is en dat de ervaring in de dagelijkse wereld een voldoende voedingsbodem is voor de ontwikkeling van een natuurlijke taal. De beginselen van de generatieve grammatici zijn volgens hen niet wetenschappelijk gefundeerd, maar slechts subjectief. Door gebruikmaking van experimenten en gebruiksgebaseerde modellen, proberen cognitieve linguïsten als Michael Tomasello tot op de dag van vandaag aan te tonen dat de aanname van een aangeboren taalvermogen in de mens overbodig is. Volgens hen is de ontwikkeling van taal slechts het logische gevolg van een aantal fundamentelere cognitieve vaardigheden van de mens. Deze vaardigheden omvatten imitatie, het begrijpen van intentioneel gedrag, het herkennen van patronen, etc. De taal kadert volgens hen in dit hoger kennisverwervend vermogen. De discussie hieromtrent is echter nog volop bezig. Recent zijn er bijvoorbeeld ontwikkelingen geweest in de neurologie, die een deel van de hersenen (het Brocagebied) in verband leggen met taalgebruik. Deze ontdekking wordt echter door de beide takken van de taalkunde anders geïnterpreteerd. Men is nog ver van uitsluitsel ...